CLAIMS

1. A planar filter comprising a planar resonator (1, 20) including:

- a conductive region (2, 21) supporting a first resonating mode propagating along a first conductive path (3); said conductive region (2, 21) being a smoothed contour shaped region; and

- a conductor-free region (5) made in said conductive region (2, 21);

characterized in that said conductor-free region (5) is a smoothed contour shaped region symmetrically disposed along a region axis (6) forming an angle θ with respect to said first conductive path (3).

2. The planar filter according to claim 1, characterized in that it supports a second resonating mode propagating along a second conductive path (4), said second resonating mode being perpendicular to said first resonating mode, and said conductor-free region (5) causing a perturbation of the symmetry of said planar resonator (1, 20) resulting in a frequency shift of said resonating modes and their mutual coupling.

3. The planar filter according to any of claims 1 or 2, characterized in that said conductor-free region (5) is made internally to said conductive region (2, 21).

4. The planar filter according to any of claims 1-3, characterized in that said angle θ is an odd multiple of 45°.

5. The planar filter according to any of claims 1-4, characterized in that said conductive region (2) has a polygonal shape with edges significantly rounded.

6. The planar filter according to claim 5, characterized in that each of said edges significantly

rounded has a bending radius in the range of about 10% ÷ 30% of the mean value of the polygon side lengths.

7. The planar filter according to any of claims 1-4, characterized in that said conductive region (21) has an elliptical shape.

8. The planar filter according to any of the preceding claims, characterized in that said conductor-free region (5) is an elliptical shape region having its major axis parallel to said region axis (6).

9. The planar filter according to any of the preceding claims, characterized in that it comprises at least a pair of planar conductive leads (8), (9) for coupling high frequency signals into and out of said dual mode planar resonator (1, 20).

10. The planar filter according to claim 9, characterized in that said at least a pair of planar conductive leads (8), (9) is capacitively coupled to said dual mode planar resonator (1) through respective gaps (C1-C2).

11. The planar filter according to claim 9, characterized in that said at least a pair of planar conductive leads (8), (9) is inductively coupled to said dual mode planar resonator (1) through respective taps (T1-T2).

12. The planar filter according to any of the preceding claims, characterized in that the conductive region (2, 21) is made by a superconductor material.

13. The planar filter according to claim 12, characterized in that said superconductor material is a high-temperature oxide superconductor.

14. The planar filter according to claim 13, characterized in that said high-temperature oxide superconductor is represented by an yttrium (Y) family

superconductor.

15. The planar filter according to claim 13, characterized in that said high-temperature oxide superconductor is represented by a bismuth (Bi) family superconductor.

16. The planar filter according to claim 13, characterized in that said high-temperature oxide superconductor is represented by a thallium (TI) family superconductor.

17. The planar filter according to claim 12, characterized in that said superconductor material comprises a metallic superconductor.

18. A receiver front-end (100) for use in a transceiver station of a wireless communication network, said receiver front-end (100) comprising:

- a first node (101) coupled to a transceiver antenna (102);

- a second node (103) coupled to signal processing sections (104) of said transceiver station; and

- a receiving branch (106) inserted between said first and second nodes (101), (103), said receiving branch (106) comprising a cryostat (109) enclosing a low noise amplifier (111);

characterized in that said cryostat (109) encloses a planar filter (110) made according to any of claims 1-17, said planar filter (110) being mutually connected in cascade arrangement to said low noise amplifier (111).

19. A receiver front-end according to claim 18, characterized in that it includes a transmitting branch (105) inserted between said first and second nodes (101), (103), said transmitting branch (105) comprising a transmitting filter (107) made according to any of claims 1-17.